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(71) Applicant: **Corus Staal BV**
1970 CA Ijmuiden (NL)

(72) Inventors:
- **Parker, Malcolm**
  Penllergaer, Swansea SA4 9ZJ (GB)
- **van Tol, Bernardus Maria**
  1921 CD Akersloot (NL)

(74) Representative: **Bodin, Andre**
Corus Technology BV
P.O. Box 10000
1970 CA Ijmuiden (NL)

(54) **Lid, method for producing said lid, and method of packaging a stack of metal sheets using said lid**

(57) Lid for covering the top side of a stack of a plurality of substantially rectangular metal sheets positioned on a support platform, the lid comprising a substantially rectangular main portion of substantially the same length and width as the stack, a first and a second longer side and a first and second shorter side foldably connected to the main portion along the edges of the main portion, the sides of the lid extending downwardly for covering the top surface of the stack and at least partly covering the sides of the stack, wherein the lid is made from a single piece of folded polymer sheet material.

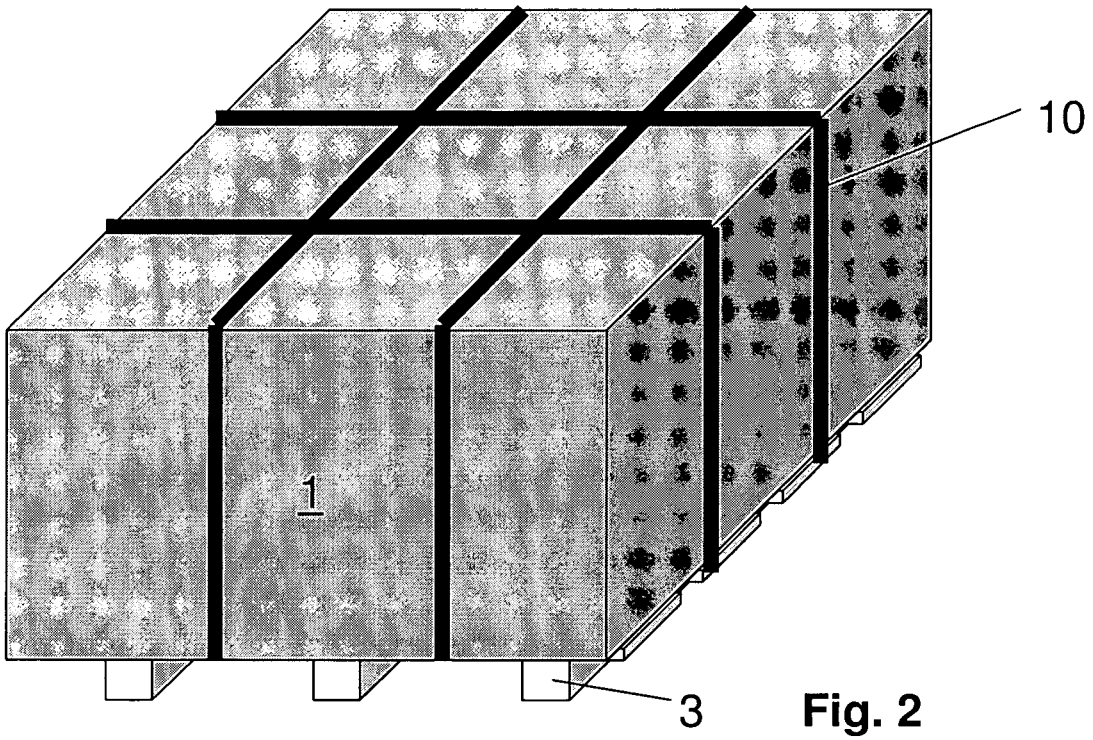

Fig. 2

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Description

[0001] The invention relates to a lid for covering the top side of a stack of a plurality of substantially rectangular metal sheets positioned on a support platform. The invention also relates to a method of producing such a lid and a method of packaging a stack of a plurality of substantially rectangular metal sheets using said lid.

[0002] Metal sheets are often sold to customers in the form of a stack of sheets. Such a stack is usually placed onto a support platform, such as a wooden pallet, and suitably packaged. Such a stack is transported to the customer. Such transport requires that the packaging provides protection against damage by impact or by corrosion that may occur as a result of exposure to moisture.

[0003] Sheet metal emerges from the production mill in the form of a long single sheet which is coiled. When the metal is to be packaged for shipping, a coil is transported to the cutting area and loaded onto a spooling and cutting device. A portion of the coil is uncoiled and a shear descends to cut substantially rectangular sheet of metal from the coil. This uncoiling and cutting process is performed in a continuous motion such that many sheets of metal are cut from each coil. At the packaging area a number of metal sheets are stacked on top of each other in the piling device. The piling device provides a means for straightening the stack of steel sheets prior to packaging such that the edges of all the sheets are aligned with each other. The device comprises a support platform upon which the stack of sheets rests, the base having planar dimensions of substantially the same length and width as the steel sheets forming the stack.

[0004] In many prior art packaging assemblies the packaging process begins in the piling device. Prior to any introduction of steel sheets into the device a support platform is placed in the piling device. Steel sheets are then stacked on top of the platform. When the stack contains the proper amount of sheets the stack is removed from the piling device. On top of the stack a cardboard cover sheet is positioned. Cardboard wraps may be placed around the sides of the stack. To provide stiffness and protection to the stack, labourers then apply protective steel corner brackets to each bottom corner and or each top corner of the stack over the cardboard wraps and cover sheet. These brackets may overlap each other at the middle of each side of the stack. Then one or more steel binding straps are applied around the package. The straps secure the bundle to the support platform which permit the bundle to be handled by a forklift. The assembly as described is then shipped, often overseas. Significant drawbacks attend such a package assembly. The vast majority of the surface area of the stack is covered only by the cardboard lining, which is susceptible to puncture or tearing. A puncture hole can allow moisture to contact the stack, causing corrosive damage that the lining is meant to prohibit. The possibility of puncture is heightened by the lack of structural stiffening of the stack prior to and during the application of the angle iron. The lack of stiffening may allow the stack to become skewed during handling. Such skewing causes sharp edges and corners of sheets within the stack to protrude and contact the lining, causing punctures to occur. Further, the application of the angle iron to the stack is a time consuming, labour intensive task, which uses relatively expensive material. Also, the resultant uneven package exterior detracts from the ability to stack the packages stably on top of each other, and further, renders the package more susceptible to damage by inadvertently catching the protruding angle iron on another package or other object. The purchase, handling and storage of these corner or edge brackets is expensive, an a logistical nuisance.

[0005] For more demanding ways of transport, a metal lid is sometimes used instead of corner or edge brackets. Such a lid not only protects the corners and edges against damage, but also the top of the stack.

[0006] The use of a steel lid has a number of disadvantages. Firstly such a lid is disadvantageous since this item is expensive and of fixed size. If such a lid has an excessive size, and so is larger than the stack, the tinplate will shift inside the lid during transit, possibly resulting in damage. The steel lid can only be used once, since its size is tailored to the metal sheets to be packaged. As each customer has his own specifications for the sheet dimensions, down to millimetre specifications, each set of lids for an order has to be made to size. Excess lids have to be ordered in case of damage of one or more of the lids during transport from the lid production to the packaging department of the metal sheet producer. After the order has been dispatched, the excess lids have to be discarded, because practically no one order is the same as the next in terms of sheet dimensions. Storing these excess lids until they can be used for a suitable follow-up order requires a lot of handling and storage and is not deemed practical.

[0007] The object of the present invention is to provide a method of packaging a stack of metal plates which produces a package suitable for overseas export, as well as inland transport, but which can avoid the use of a steel lid as described above.

[0008] Another object of this invention is to provide a simple packaging method which is not labour intensive, in comparison to the conventional export packaging and also than for the conventional inland packaging.

[0009] A further object of the invention is to limit the amount of variation needed in the packaging for different stack sizes and the number of different types of material used.

[0010] Still a further object of the invention is to enable re-use of the packaging.

[0011] One or more of the objects according to the invention is reached by a lid for covering the top side of a stack of a plurality of substantially rectangular metal sheets positioned on a support platform, the lid comprising a substantially rectangular main portion of substantially the same length and width as the stack, a first and a second longer side and a first and second shorter side

foldably connected to the main portion along the edges of the main portion, the sides of the lid extending downwardly for covering the top surface of the stack and at least partly covering the sides of the stack, wherein the lid is made from a single piece of folded polymer sheet material.

[0012] By producing the lid from a single and integral piece of a suitable polymer sheet material the lid can be formed by folding rather than by assembling. This reduces the need for storage of parts, and it reduces the amount of work involved in producing the lid, thereby resulting in a significant cost reduction. The polymer material should be adequately thick to provide protection against damaging of the sheet metal by impact or scratching during transport, or to prevent damaging of the sheet metal by the restraining band which are often used to bind the stack and the lid to the support platform to form the assembly comprising the support platform, the stack of sheets and the lid. A polymer sheet in this respect is therefore not a foil. Preferably the polymer sheet has a thickness of at least 0.5 mm, and more preferably of at least 1 mm. Foils usually have a thickness of about 30 to 50 μm and provide no protection against impact and rupture very easily due to the sharp edges of the cut metal sheet. These foils are mainly used to protect against moisture and dirt. It is noted that, although it is also possible to produce the polymer lid by assembling it from several loose parts, for instance by gluing, welding or riveting, it is strongly preferred to produce the lid from a single and integral piece of polymer sheet material. It is noted that when it is said that the lid is made from a single piece of folded polymer sheet material this means that the lid comprises substantially completely of the polymer sheet material, and that the use other materials which may be used to form the lid, or to retain it in a lid-shape, is limited. These other materials may comprise securing means such as glue, staples or adhesive tape. Preferably the sides of the lid are dimensioned such that the top surface of the stack and all sides of the stack are completely covered.

[0013] Using a lid according to the invention a stack of a plurality of substantially rectangular metal sheets positioned on a support platform can be very quickly and effectively packaged by putting said lid over the top of such a stack, thereby covering at least the top of the stack and, depending on the size of the sides at least part of the sides of the stack. When suitably dimensioned, the sides of the lid may extend downwardly to cover the entire stack, and even part of the support assembly. The sides of the lid are folded down so as to form a lid. In its simplest form, the starting piece of polymer sheet material is cross shaped, the main portion forming the body of the cross and the four sides forming the arms of the cross. After folding, the sides can be secured in the folded position for instance using adhesive tape, or by means of the aforementioned restraining bands.

[0014] In an embodiment of the invention, tabs are foldably connected to the longer sides and/or the shorter sides for folding over and secured to, in the folded position, the adjacent shorter or longer side by securing means so as to form a lid. In this form, the starting piece of polymer sheet material is preferably rectangular. The tabs are an integral part of the polymer material and each tab is foldably attached to one of side edges of the longer or shorter side. This embodiment allows securing the tabs after perpendicularly folding the sides with respect to the main portion to the adjacent side edge, for instance by adhesive tape, or by putting one or more staples through the tab and the underlying shorter or longer side.

[0015] In an embodiment, the fixing of the longer side to the shorter side in a folded position, either by a tab foldably attached to either of the sides and secure to the other side, or by any other means, is detachable. After this detachment, the lid can be returned to sheet form and returned for renewed use to the supplier of the stacked metal sheets. Some customers place recurring orders for the same dimensions, and the unfolded sheets can be reused for packing the next order of the same dimensions.

[0016] In a preferred embodiment, wherein the longer side is provided with a slit, and the shorter side is provided with a tongue which, in a folded position, fits into the slit, thereby fixing the longer side to the shorter side. Of course the slit may also be provided in the shorter side and the tongue in the longer side. If each side is secured to the adjacent side by one such slit-tongue combination, 4 slit-tongue combinations are needed to securely form a folded lid. In an embodiment, an easy release tab is also provided in the tab. This allows the slit-tongue combination to be easily released after unpacking.

[0017] It is also possible to provide a plurality of slit-tongue combinations in a shorter side for connecting to a longer side. By using more than one slit-tongue combination at a given corner, a stronger connection is achieved. This may be particularly relevant for higher stacks of sheets, or for lids intended to cover the entire height of the stack. However, the same effect can be reached by using one slit-tongue combination per corner and providing a restraining band around the circumference of the lid once it has been positioned on top of the stack.

[0018] In an embodiment of the invention, the tongue is formed in the tabs. In another embodiment, the tongue is formed in the longer or shorter side and the slit is formed in the tabs. In still another embodiment more than one slit-tongue combination is provided at a given corner wherein the slits and tongues alternate, in case of two slit-tongue combinations, one slit is in the tab and one tongue is in the tab.

[0019] In an embodiment of the invention, the single piece of polymer sheet material is cut from a coil of polymer sheet, such as by mechanical cutting or by laser-cutting in a cutting device, such as a cutting table. This means that the polymer sheet can be provided in a form allowing to produce a wide variety of lids from the coil with a minimum of waste polymer scrap and a minimum

of stock. The cutting device can also be used to score the folding lines. Scoring means that the folding line is only partly cut. This score, for instance a cut down to about half the thickness of the sheet, allows for a sharp fold at the intended location, thereby achieving very exact dimensions of the lid allowing a snug fit around the stack of sheet metal. When for instance folding to a sharp angle of , for example, between 45 and 135°, such as 90°, the score is preferably located on the outside of the angle. This scoring greatly facilitated the folding and the sharpness of the fold. However, any other means of facilitating the folding and improving the sharpness of the fold may also or alternatively be used, such as a local plastic hinge, for instance brought about by a local heat treatment along the folding line.

[0020] To avoid propagation of the score to the full thickness after folding, it is preferable not to score the folding line at the extremities of the folding line, i.e. near the edges of the sides. Although this results in a less perpendicular angle of the side with respect to the main portion of the lid, the resulting lid proves to be more resilient and practically excludes the risk of shearing at the extremities of the folding line.

[0021] In an embodiment of the invention, the lid as described hereinabove, serves as a tray for receiving a stack of metal sheets. By turning the lid upside down, a tray is formed in which a stack of metal sheets can be placed. The bottom of the stack and at least part of the sides of the stack are covered by the sides of the tray. This may be done in the cutting line, or later. The tray is preferably put on top of a support platform, such as a pallet. Once the stack is placed in the tray, a lid according to the invention may be placed over the top of the stack. The sides of the lid may be chosen such that the sides of the stack is are only partly covered, but the sides may also extend over the sides of the tray, thereby completely covering the sides of the stack. Restraining bands or the like may then be used to form the assembly comprising support platform, stack, tray and lid. If the sides of the lid have to extend over the sides of the tray, the lid has to be dimensioned slightly larger to allow this. This may mean that the main portion of the lid is slightly larger than the main portion of the tray. Although it is also possible that the side edges of the tray extend over the side edges of the lid, this is less preferable because of the risk of water penetrating the package, and because it is less practical during stacking. It should be noted that conventional sheet cutting lines are designed so as to produce a high quality of the stack in terms of straightness of the stack. By placing a tray in the stacking device, precautions have to be made to ensure that the stacking quality is maintained at the level required for transport, and for destacking at the customer.

[0022] In an embodiment a lid is produced from polymer sheet material which is sufficiently flexible to allow folding, with and/or without scoring, and sufficiently resilient to impact to avoid failure during use and to avoid damage of the stack of metal sheets for instance by use of metal or polymer restraining bands. After scoring the polymer should resist propagation of the score when the polymer is folded. The polymer sheet used for the production of the lid may be any suitable polymer, preferably a thermoplastic polymer. A suitable polymer should not be brittle, easy to cut and be foldable. Preferably the material should be recyclable and/or allow reuse of the lid. Polyolefins or polyalkenes, such as polyethylene or polypropylene are suitable. ABS, polycarbonate, polyesters or any other polymer may be used instead provided the material can be cut and folded into a lid, and that the lid as such is able to withstand the hardships of packaging a stack of metal sheets and the transport thereof. In a preferred embodiment the polymer sheet comprises polyethylene, because it is very flexible, easy to cut, and sturdy. Preferably the polymer sheet has a thickness of at most 5 mm, more preferably having a thickness between 1.2 and 2.5 mm, such as about 1.6 or 2.0 mm. When the polymer is thicker than 5 mm, it is not flexible enough to be folded. If the polymer is too thin, it does not provide sufficient protection against impact or rupture. A thickness of between 1.2 mm and 2.5 mm allows for sufficient impact resistance, while it is excellently foldable, particularly after scoring the folding line. When using a thermoplastic hinge to fold the sheet along the folding line, the thickness may be chosen thicker. In an embodiment the polymer is a co-extruded polymer comprising one or more layers of polymer. In an embodiment of such a co-extruded polymer, the extrudate comprises a top layer which is appropriately coloured, and a main layer which has a commodity colour. In an embodiment the restraining bands comprise polyethylene.

[0023] In an embodiment the lid is used to package a stack of steel sheets, such as tinplate, tin free steel (TFS), hot rolled steel sheet or plate, or cold rolled steel sheet.

[0024] According to a second aspect of the invention a method of packaging a stack of metal sheets is provided comprising the steps of:

- placing the stack to be packaged onto a support platform of substantially the same length and width as the stack;
- placing over the stack a lid according to the invention covering the top and at least part of the sides of the stack;
- tightly binding the assembly comprising the support platform, stack, and lid by means of wires, straps, shrink foil, metal or polymer restraining bands or the like passed over the top and under the bottom of the said assembly.

[0025] In this embodiment the sides of the lid preferably extend downwardly so as to completely cover the sides of the stack and optionally also part of the support platform.

[0026] In an embodiment the method further comprises the step of

- placing a tray according to the invention onto the support platform to receive the stack of metal;
- placing over the stack and the sides of the tray a lid according to any one of the preceding claims covering the top and at least part of the sides of the stack and at least part of the sides of the tray;
- tightly binding the assembly comprising the support platform, tray, stack, and lid by means of wires, straps, shrink foil, metal or polymer restraining bands or the like passed over the top and under the bottom of the said assembly.

[0027] According to a third aspect a method of producing a lid according to the invention is produced comprising the steps of:

- providing a single piece of polymer sheet material of a suitable size;
- scoring the folding lines;
- optionally cutting the slits and tongues;
- folding and securing the sheet material into a lid.

[0028] Although it is possible to perform the cutting step and scoring steps of the method manually, for instance by cutting a sheet to size using a knife or another manually operated cutting device, it is preferable to cut the single piece of polymer sheet material of a suitable size to specification using a computer controlled cutting apparatus, preferably from a coil of polymer sheet material. This embodiment allows producing the cut sheet to precisely the required size at a moment to ensure that the cut polymer sheet is available for folding into a lid once the material to be stacked is produced. The computer controlled cutting table may even be linked to the control of the shearing device. The automatic cutting table can be fed with coiled polymer sheet, and the effort to fold the lids can be performed by staff supervising the shearing and piling operation, thereby requiring no additional staff.

[0029] The sheet package assembly is designed to protectively enclose stacks of sheet steel for shipment. The lid is formed from a single piece of polymer material. The secondary material sheet is cut to allow two longer sides and two shorter sides to be folded down to a position perpendicular to the lid's main portion. In this embodiment when the shorter side is folded to its downward position, each end of the shorter side extends beyond an edge of the longer side. These extensions form tabs which are folded around the longer sides or are folded so that the longer sides envelop the tabs and secured to the longer sides. These corners could, of course, be created by cutting tabs on each of the longer sides and folding and securing the tabs to the shorter side. A typical dimension for such steel sheets is approximately two meters long by one meter wide. Customers usually order these sheets to the exact millimetre and the lid is produced slightly oversized to facilitate manipulation over the stack of sheets. One or more restraining bands encircle the package width wise and/or lengthwise and hold the support platform in place against the bottom of the tray. Collectively the straps tightly secure the tray and cover to the enclosed stack of steel sheets. If so desired, one or more restraining bands may be used to encircle the lid along its circumference, thereby securing the shorter and longer edges tightly against the edges of the stack. When stored and shipped the package rests on the support platform, allowing access to the bottom of the package for forklifts and cranes. Racking and twisting are prevented by the lid and straps. The support platform prevents bending. The encompassing polymer protects the sheet metal and the optional liner from damage. The lid over the outside of the tray keeps water from getting into the package.

[0030] A cover sheet, such as a cardboard sheet, may be put on top of the stack and/or a film liner may be wrapped around the stack prior to positioning the lid on top of the stack. This liner may be a polyethylene film which is stretched while wrapping it around the stack, and which is wrapped around it in a number of layers. The film thickness is typically about 30 μm thick and stretched 150%. A wrapping containing ten layers therefore results in a thickness of 0.2 mm of thin film layers. This wrapping is mainly used to protect the stack against moisture. Due to the thinness of the material and the sharpness of the metal sheets it provides practically no protection against mechanical impacts.

[0031] The invention is now further explained by means of the following, non limiting schematical drawings and examples.

[0032] Figure 1 shows a support platform 3, a stack of metal sheets 2 and a lid 1.The support platform may be a pallet, such as a wooden pallet. This support platform provides the stack of sheets to be placed upon it with sufficient stiffness during transport. The stack is piled on top of the platform, usually immediately after the metal sheet cutting operation. The lid 1, having a substantially rectangular main portion 1a of substantially the same length and width as the stack 2, a first and a second longer side 1b (only one visible) and a first and second shorter side 1c (only one visible) foldably connected to the main portion along the edges of the main portion, the sides 1b, 1c of the lid 1 extending downwardly for covering the top surface 2a of the stack 2 and at least partly covering the sides of the stack 2b.

[0033] Figure 2 shows the elements of figure 1 in an assembly of lid, support platform and stack (not visible) held together by restraining bands 10, for instance metal bands. Figure 3 shows a similar assembly wherein the sides of the lid do not extend to the support platform, but only partly cover the stack of metal sheets. Item 11 is a restraining band around the circumference of the lid which has been attached once the lid has been positioned on top of the stack. Figure 3 shows a similar assembly as in Figure 2, but without the lid extending downwardly to the base of the stack, the base being the position where the stack touches the support platform. The lid only partly

covers the sides of the stack. The optional foil around the stack is not shown.

[0034] Figure 4 shows a schematical drawing of one single rectangular piece of polymer sheet material. In this drawing the dashed lines indicate a scored folding line, the drawn black lines indicate an unscored folding line, and the white lines indicate a cut through the entire thickness of the material. Area 1a indicates the substantially rectangular main portion of substantially the same length and width as the stack to be packaged, 1b indicates the first and second longer side and 1c indicates a first and second shorter side 1c. The sides are foldably attached to the main portion, because the folding line is only scored to allow easy and crisp folding. The folding line is not cut through the entire thickness. Tabs 1d are foldably attached to the side edges of the longer sides in this example. The tabs are not connected to the shorter sides as indicated by the white (cut) line. In the tabs a tongue and an easy release tab 8 is provided. In the shorter side the slits are provided. Figure 5 provides an enlarged part of figure 3 illustrating a particular form of the slit-tongue combination. In this example, the slit 4 is provided in the side 1c, and the tongue 5 is provided in the tab 1d which is foldably attached to side 1b. After folding along the folding lines 6, which have been scored except for the extremities 7, tongue 5 is introduced into slit 4 on one side of side 1c, wherein the tongue protrudes the slit and emerges on the other side of the side 1c. Preferably, the tab is folded such that the tab ends up inside the lid. In use as a lid for packaging a stack of sheet metal the tab rests against the stack, and the side 1c fold over the tab, thus forming the outside of the lid. This way of folding is generally preferable for each embodiment of the invention. It is also possible to fold the side 1c against the stack in which case the tab folds over the side 1c, and the tongue protrudes the slit from outside the lid to inside the lid. This is however less preferable, as this may lead to unwanted release of the tongue-slit combination during use. In figure 5 an easy release tab 8 is provided in tab 1d. As a consequence of the tongue protruding the slit under a slight angle, the easy release tab show a slight offset. This offset can be used to put a finger behind, and by doing so, the tongue can be easily flipped out of the slit. In Figure 5 a schematic top view is given of this situation. Note that the distance between the lid and the stack is exaggerated for clarity. In practice, there should be a snug fit of the lid around the stack and or the tray, if a tray is used. The score 9 to facilitate folding is also indicated. Figure 6 shows a cross-section of the tongue-slit combination as seen from above. The tongue 5 of tab 1d protrudes through slit 4 in side 1c. Tab 1d is foldably attached to side 1b. The scored folding line 9 is indicated. The distance between stack 2 and the lid is exaggerated for the purpose of clarity.

[0035] It is noted that in the above given examples and embodiments a rectangular tongue-slit combination is used. However, in any embodiment the tongue and or slit may be provided with a different form. The tongue and/or slit may for instance be triangular, curved or octagonal.

Claims

1. Lid (1) for covering the top side (2a) of a stack (2) of a plurality of substantially rectangular metal sheets positioned on a support platform (3), the lid comprising a substantially rectangular main portion (1a) of substantially the same length and width as the stack, a first and a second longer side (1b) and a first and second shorter side (1c) foldably connected to the main portion along the edges of the main portion, the sides (1b, 1c) of the lid (1) extending downwardly for covering the top surface (2a) of the stack and at least partly covering the sides of the stack (2b), wherein the lid is made from a single piece of folded polymer sheet material.

2. Lid according to claim 1 wherein tabs (1d) are foldably connected to the longer sides (1b) and/or the shorter sides (1c) for folding over and secured to, in the folded position, the adjacent shorter or longer side by securing means so as to form a lid.

3. Lid according to claim 1 or 2 wherein the longer side is detachably fixed to the shorter side.

4. Lid according to claim 1, 2 or 3 wherein the longer or the shorter side is provided with a slit (4), and wherein the shorter or the longer side is provide with a tongue (5) which, in a folded position, fits into the slit (4), thereby fixing the longer side to the shorter side.

5. Lid according to claim 4 wherein the tongue is formed in the tabs (1d).

6. Lid according to claim 4 or 5 wherein the tongue is formed in the longer or shorter side and wherein the slit is formed in the tabs (1d).

7. Lid according to any one of the preceding claims wherein the single piece of polymer sheet material was provided by cutting from a coil of polymer sheet.

8. Lid according to any one of the preceding claims wherein folding lines (6) for folding the shorter side and/or the longer sides and/or the tabs are scored to facilitate folding, preferably wherein one, more or all of the extremities (7) of the folding lines (6) are unscored.

9. Lid according to any one of the preceding claims wherein the polymer sheet material is a polymer which is sufficiently flexible to allow folding after scoring, and sufficiently resilient to impact to avoid failure

during use and to avoid damage of the stack of metal sheets.

10. Lid according to any one of the preceding claims wherein the polymer sheet comprises polyethylene, preferably having a thickness of between 1 and 5 mm, more preferably having a thickness between 1.2 and 2.5 mm.

11. Method of producing a lid according to any one of the preceding claims comprising the steps of:

- providing a single piece of polymer sheet material of a suitable size;
- scoring the folding lines (6);
- optionally cutting the slits (5) and tongues (4);
- folding and securing the sheet material into a lid or tray;

12. Method according to claim 11 wherein the single piece of polymer sheet material of a suitable size is cut to specification from polymer sheet material, preferably from a coil of polymer sheet material, using a computer controlled cutting apparatus, such as a cutting table.

13. A method of packaging a stack of metal sheets comprising the steps of:

- placing the stack to be packaged onto a support platform of substantially the same length and width as the stack;
- placing over the stack a lid according to any one of the preceding claims covering the top and at least part of the sides of the stack ;
- tightly binding the assembly comprising the support platform, stack, and lid by means of wires, straps, shrink foil or the like passed over the top and under the bottom of the said assembly.

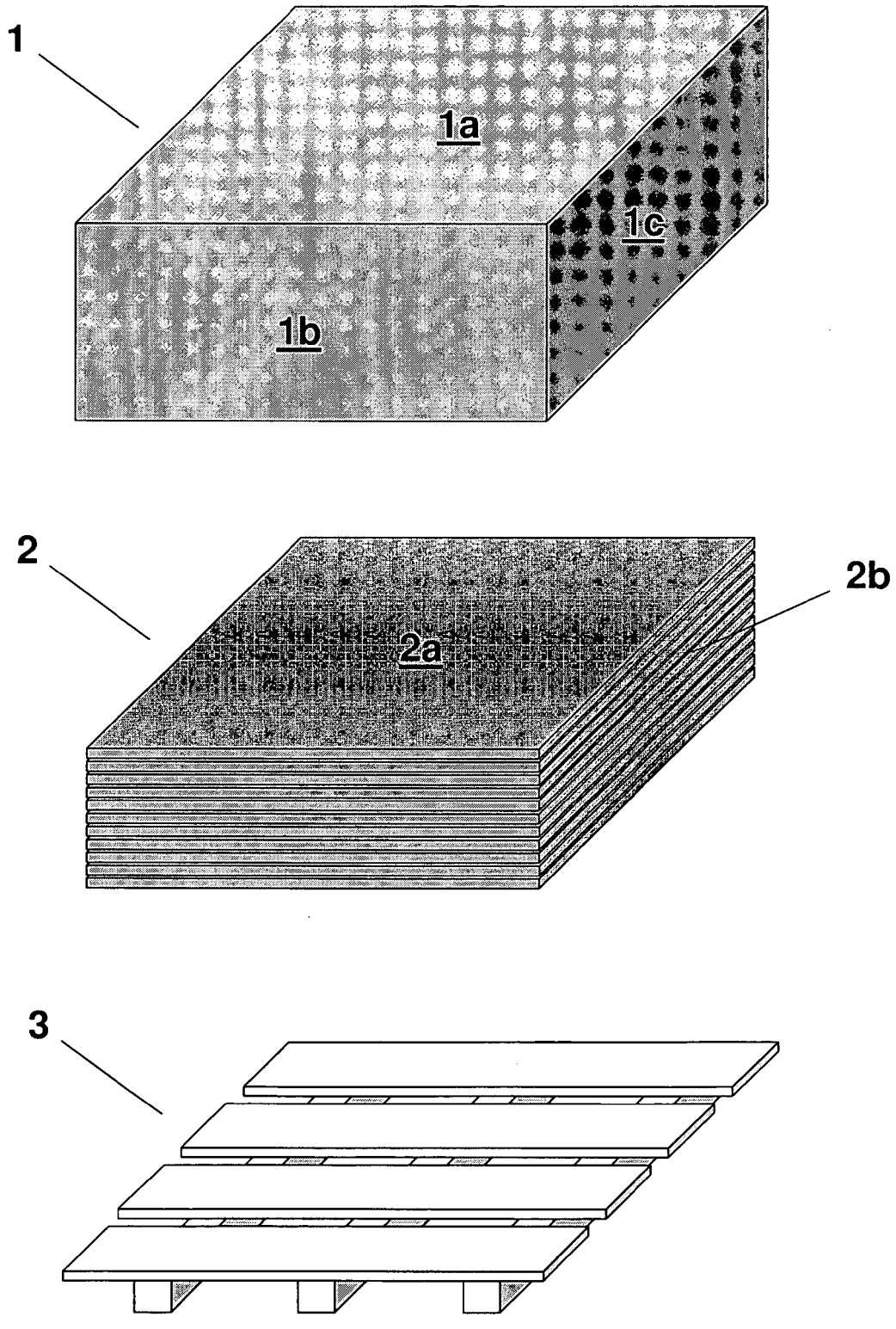

Fig. 1

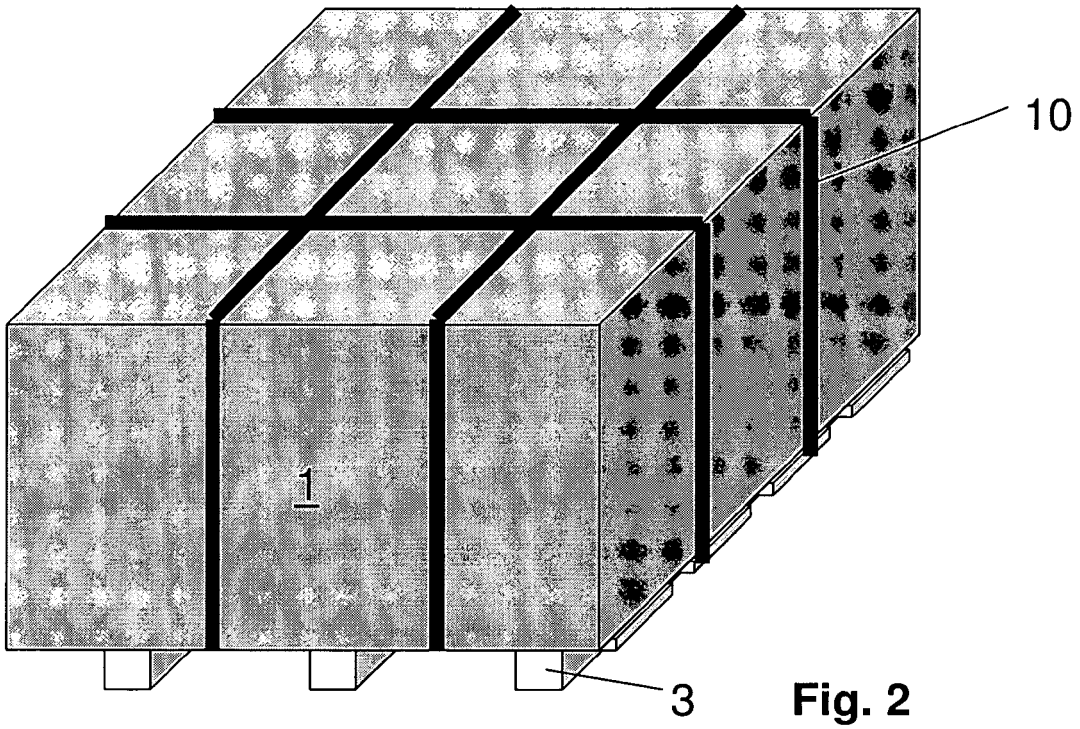

Fig. 2

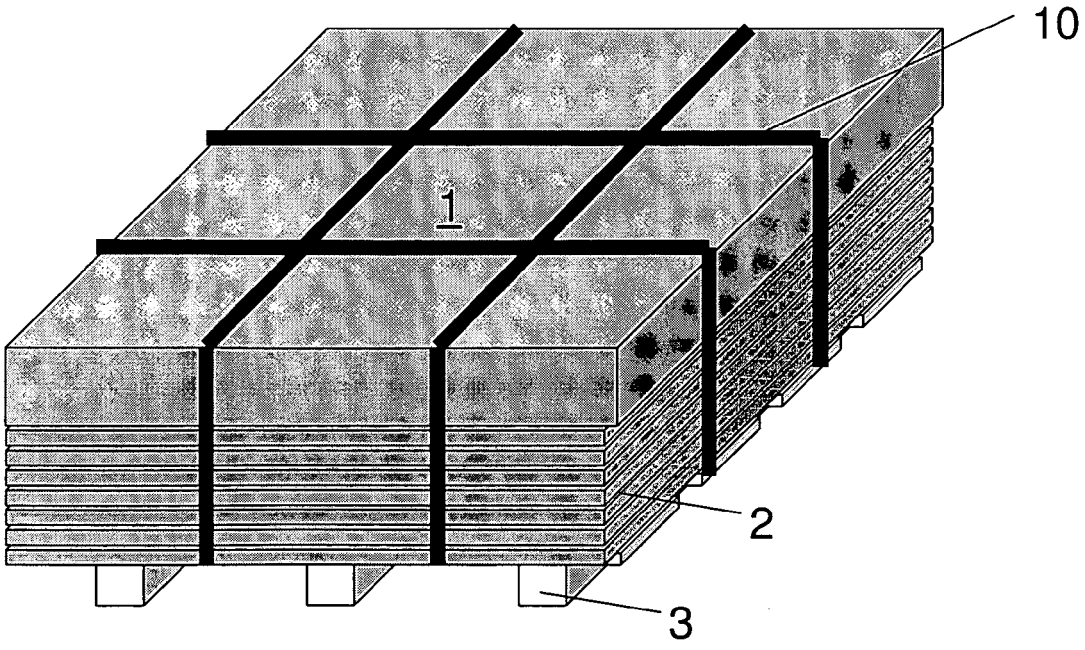

Fig. 3

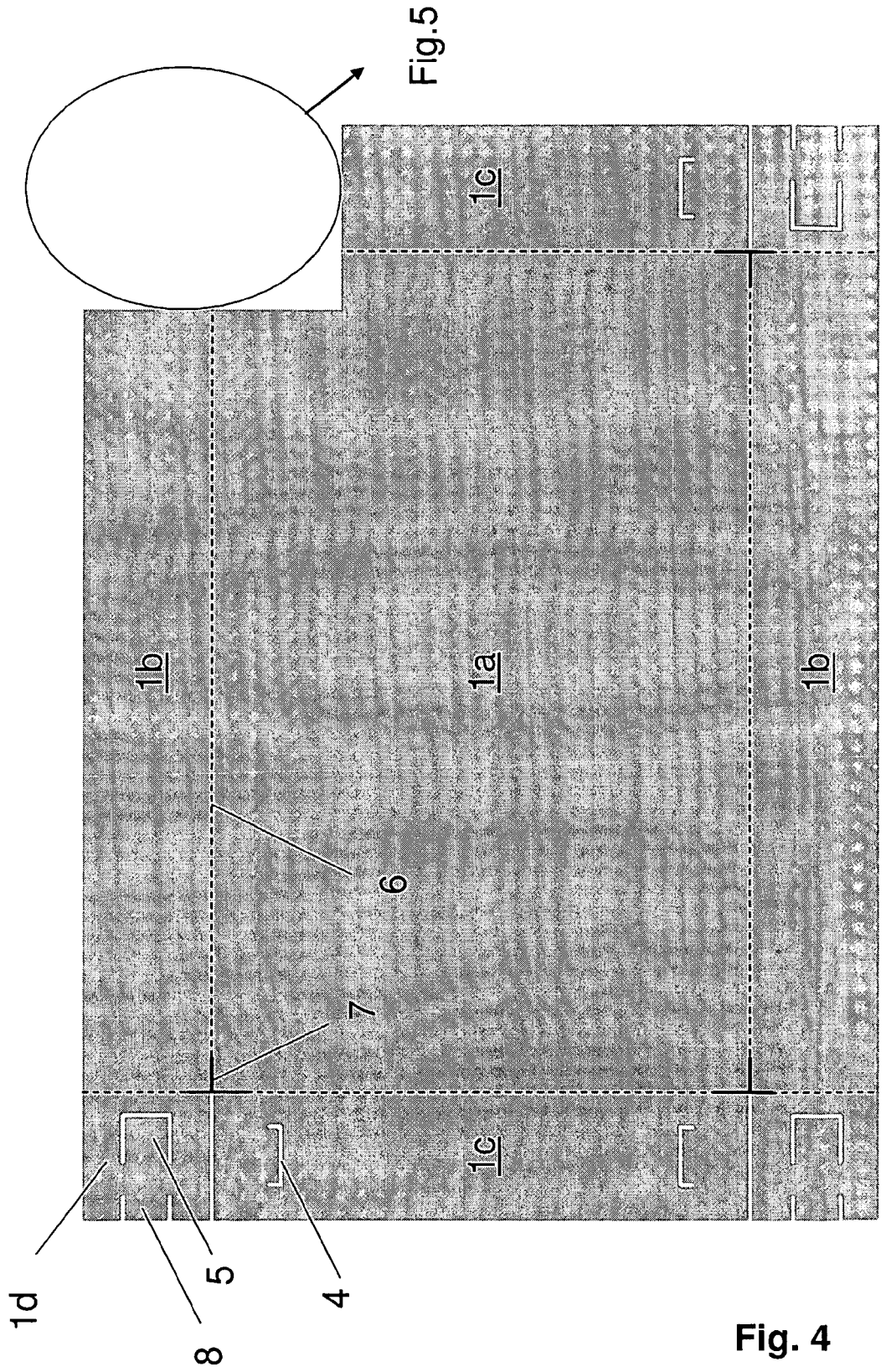

Fig. 4

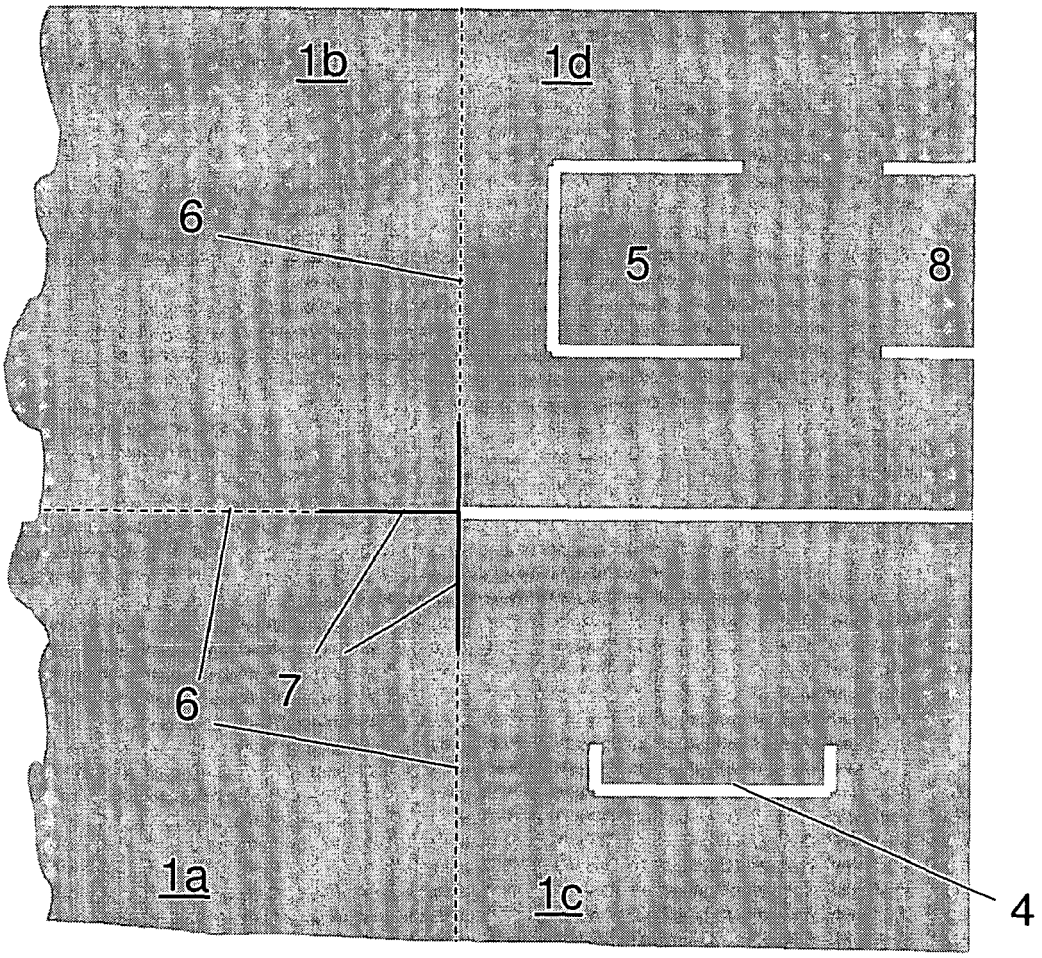

Fig. 5

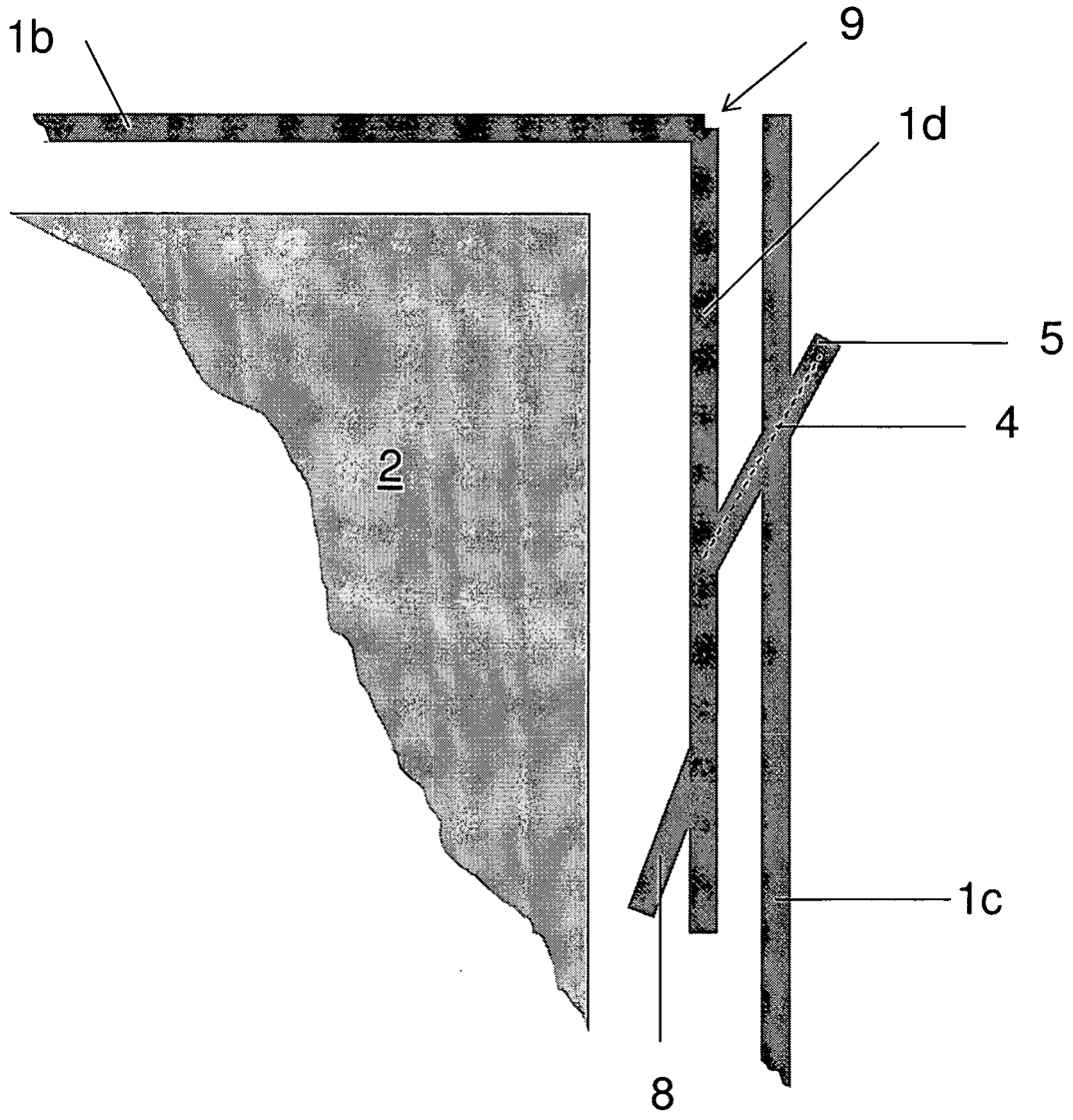

Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 00 8092

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 August 2007	Appelt, Lothar

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 00 8092

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